



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,790	03/12/2004	Kenneth L. Smith	34121US (KDK)	8337
7590 02/08/2006 Richmond, Hitchcock, Fish & Dollar PO Box 2443 Bartlesville, OK 74005			EXAMINER BOMAR, THOMAS S	
			ART UNIT 3672	PAPER NUMBER

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/799,790	SMITH ET AL.	
	Examiner	Art Unit	
	Shane Bomar	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule.17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/12/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 22 and 30 are objected to because of the following informalities: the recitation of “claim 21; and” is slightly awkward as currently worded and it is suggested to amend the preamble as follows: --claim 21, further comprising the step of:--; the recitation of “said non-rotatable section” in claim 30 lacks proper antecedent basis in claim 29, although it is noted that basis can be found in claim 28. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 4, 6, 8, 10, 12-15, 17, 21, and 28-31 are rejected under 35 U.S.C. 102(e) as being anticipated by US patent 6,899,186 to Galloway et al.

Regarding claim 1, Galloway et al disclose a drilling shoe 160 coupled to casing section 150, the shoe comprising: a fixed section 315 adapted to be coupled to the casing section; a rotatable section, or bit, 140 coupled to the fixed section; the bit being rotated relative to the fixed section 315 when a mud motor is used to rotate just the bit itself (see Fig. 3 and col. 4, lines 1-2). It is noted that the remainder of the limitations in the claim are seen as merely functional limitations since no definitive structure is provided to show how the functions are to be

Art Unit: 3672

performed by the apparatus. Therefore, these functional limitations are given very little patentable weight and the prior art only needs to be capable of performing the intended functions of the claim. In the instant reference, once a section of casing is drilled to depth, the shoe 160 is collapsed and locked to the casing via a key 330, whereby the mud motor would stop and effectively cause the bit 140 to be locked relative to the section 315 which is locked relative to the casing section (see Figs. 5A-5B).

Regarding claim 4, the upper end of the fixed section 315 is coupled to the casing section at 310 and the lower end of the fixed section 315 is coupled to the top of the rotating section 140 (see Fig. 3).

Regarding claim 6, bit 140 is coupled to the end of the rotatable section, wherein the bit is inherently drillable since any bit is capable of being drilled. Furthermore, Galloway et al contemplate drillable materials as part of the invention (see col. 6, lines 14-21).

Regarding claim 8, the pin 310 biases the shoe toward the rotatable configuration (see Fig. 3).

Regarding claim 10, splines may be used as an internal drive member (see col. 5, lines 34-38).

Regarding claim 12, Galloway et al disclose a drilling apparatus, coupled to a casing section 150, that comprises a drilling shoe 160 selectively rotatable relative to the casing section, the bit 140 being inherently drillable since any bit is capable of being drilled; and a locking mechanism 310 or 330 prevents rotation of the shoe 160 relative to the casing section 150, whereby the bit is capable of being drilled out after the casing is set (see Figs. 3 and 5A).

Regarding claim 13, the locking mechanisms 310 and 330 render the shoe undetachable from the casing while downhole.

Regarding claim 14, the shoe comprises a fixed section at the base of casing 150 and a rotating section 315, the locking mechanism is a set of splines (or interlocking teeth), one spline on each section (see col. 5, lines 34-38).

Regarding claim 15, when the splines are disengaged, the shoe will rotate freely relative to the casing, and when the splines are engaged the shoe will not rotate freely relative to the casing, which would assist any drilling-out procedures carried out on the bit since it would not rotate relative to the bit being used for drill-out.

Regarding claim 17, a mud motor drives the bit portion 140 of the shoe relative to the casing (see col. 4, lines 1-2).

Regarding claim 21, Galloway et al disclose a method comprising: coupling a drilling shoe 160 to an end of a casing section 150; using the shoe to drill a borehole 100 by rotating a rotatable portion, bit 140, relative to the casing; and locking the shoe to the casing section with key 330 after the casing has reached the desired depth, whereby the mud motor would stop and effectively cause the bit 140 to be locked relative to the section 315 which is locked relative to the casing section (see Figs. 3 and 5A-5B).

Regarding claim 28, the end of the casing section 150 is seen as part of the drilling shoe 160, therefore, the end of the casing section is non-rotatable and is telescopically coupled with the rotatable section, wherein the two sections are shifted relative to one another (see Figs. 3 and 5A).

Regarding claims 29 and 30 (claim 30 as best understood to depend from claim 28), the upper end of the fixed section 315 is coupled to the casing section at 310 and the lower end of the fixed section 315 is coupled to the top of the rotating section 140 via a projection 330 that inserts into recess 320 (see Figs. 3 and 5B).

Regarding claim 31, Galloway et al disclose that the bit is rotated separately with a mud motor in lieu of the casing rotating the bit (see col. 4, lines 1-2), yet it is not said that the casing is no longer rotated in this alternative. Therefore, it is apparent that the casing is still rotated to avoid becoming stuck in the borehole as drilling progresses, which is a notoriously known occurrence.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8, 10-15, 17-35, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent application publication 2004/0226751 to McKay et al in view of Galloway et al.

Regarding claims 1-6, 8, 12, 21-23, 28-30, 32, 33, and 32, McKay et al teach a drillable drilling shoe 10 that is attached to casing 12, but the casing shoe rotates with the casing to carry out the drilling.

Galloway et al teaches a drilling shoe similar to that of McKay et al. It is further taught that the drilling shoe can alternatively be rotated separately with a mud motor in lieu of the casing rotating the bit (see col. 4, lines 1-2). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to combine the teachings of these references to arrive at a combination wherein the mud motor taught by Galloway et al rotates the body portion 30 of McKay et al's drilling shoe. Therefore, Figures 2 and 3 of McKay et al teach, in light of this combination, the following: a fixed section 24 attached at its upper end to the casing section 12 and at its lower end to the rotatable body portion 30; in the Figure 2 position, the rotatable body is unlocked and allowed to rotate relative to the casing; in the Figure 3 position, when the casing has reached a desired depth, the body 30 telescopes downwardly relative to the casing 12 and fixed section 24; the body 30 then becomes locked relative to the casing via pin 62, which could engage a recess in the body such as one of the recesses shown in Figures 3 and 5B of Galloway et al; once locked in this position, the body can be drilled out without the body rotating relative to the casing (see paragraph [0029] and the last sentence of paragraph [0031] of McKay et al). One would have been motivated to make such a combination since Galloway et al had already contemplated replacing the drilling shoe of the first embodiment with the drillable drilling shoe of Figures 8A and 8B, while also teaching that a mud motor can alternatively rotate a drilling shoe relative to the casing, thereby reducing the equipment and moving parts needed at the surface to rotate the drilling shoe.

Regarding claims 7, 20, and 37, the combination applied to claims 6, 12, and 32 above teaches that a spring 360 can be added into the mud bore 46 to act as a valve for controlling fluid

Art Unit: 3672

flow, and any number of said valves can be contemplated by one of ordinary skill in the art (see Figs. 2, 3, 9, and 10 of McKay et al).

Regarding claims 10 and 17-19, the combination applied to claims 1 and 12 above teaches that, as is notoriously known in the art, mud motors have drive shafts that are attached to driven members via internal drive members that define a splined opening in the driven member.

Regarding claim 11, the combination applied to claim 1 above teaches that the fixed section 24 is threadably coupled to the casing 12 (see Fig. 2 of McKay et al).

Regarding claim 13, the combination applied to claim 12 above teaches that shoulder 58 prevents the shoe from becoming detached downhole (see Figs. 2 and 3 of McKay et al).

Regarding claims 14, 15, 34, and 35, the combination applied to claims 12 and 33 above teaches that an alternative method of attaching components is with a set of splines (or interlocking teeth), one spline on the body section and one on the fixed section, and the splines would be unlocked during rotation and locked during drillout (see col. 5, lines 34-38 of Galloway et al).

Regarding claims 24 and 25, the combination applied to claim 22 above teaches that after step b and before step d, the casing is cemented by passing cement out through the drill shoe without removal of the casing or the drill shoe (see the last sentence of paragraph [0028] of McKay et al).

Regarding claim 26, the combination applied to claim 24 above teaches that, once the shoe has shifted to its extended position to open ports 37 and the drilling mud has cease to flow, one of ordinary skill in the art would notoriously know that fluids from the subterranean

Art Unit: 3672

formation could be produced through those openings due to the force of the fluid flowing out of the formation.

Regarding claim 27, the combination applied to claim 26 above teaches that during any of the previous steps, the casing section or drill shoe are not removed from the borehole (see Figs. 2-3 of McKay et al for example).

Regarding claims 31 and 38, the combination applied to claims 21 and 32 above teaches that the bit is rotated separately with a mud motor in lieu of the casing rotating the bit (see col. 4, lines 1-2), yet it is not said that the casing is no longer rotated in this alternative. Therefore, it is apparent that the casing is still rotated to avoid becoming stuck in the borehole as drilling progresses, which is a notoriously known occurrence.

6. Claims 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galloway et al as applied to claims 1 and 14 above, and further in view of US patent 4,848,469 to Baugh et al.

Galloway et al teach the drilling shoe of claims 1 and 14 that includes a spline on the rotatable section and on the fixed section, wherein the set of splines acts as intermeshing teeth. However, it is not explicitly taught that a spring biases the set of splines away from each other and towards the rotatable configuration.

Baugh et al teach a downhole component that drives another downhole component through a set of splines 36 engaging slots 41, wherein a spring 88 biases the two components out of engagement (see Fig. 4). It would have been obvious to one of ordinary skill in the art, having the teachings of Galloway et al and Baugh et al before him at the time the invention was made, to modify the spine arrangement taught by Galloway et al to include the biasing spring of Baugh et

Art Unit: 3672

al, in order to obtain an arrangement that allows the two components to properly engage. One would have been motivated to make such a combination since Baugh et al have shown it to be notoriously known in the art to use a spring to bias a spline engagement open when the spines are not lining up properly (see col. 7, lines 16-25).

7. Claims 9, 16, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKay et al in view of Galloway as applied to claims 1, 14, and 34 above, and further in view of Baugh et al.

The same combination and motivation can analogously be applied to these claims as was applied to claims 9 and 16 above to reach the same spring biased spline engagement.

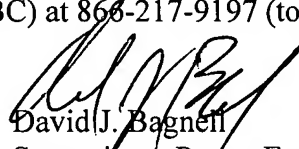
Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Caraway, Chernyshev et al, Giroux et al, Hughes et al, Makohi et al, Mocivnik et al, Strong et al, and Wardley teach various drilling shoe configurations of particular interest. Brown et al and Coffman et al show evidence of mud motors with splined drive shaft connections to downhole components.

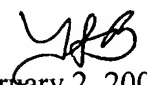
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane Bomar whose telephone number is 571-272-7026. The examiner can normally be reached on Monday - Thursday from 6:30am to 4:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David J. Bagnell
Supervisory Patent Examiner
Art Unit 3672

tsb 
February 2, 2006